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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/586,541	07/19/2006	Yuzo Senda	Q95983	4649

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EXAMINER
ALPHONSE, FRITZ

ART UNIT	PAPER NUMBER
2112	

MAIL DATE	DELIVERY MODE
04/01/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
	10/586,541	SENDA, YUZO
Office Action Summary	Examiner	Art Unit	
	FRITZ ALPHONSE	2112	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>1</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>19 July 2006</u>.

2a)☐ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-53</u> is/are pending in the application.

　　4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) <u>1-53</u> are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

　　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

　　Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　　a)☐ All b)☐ Some * c)☐ None of:

　　　1.☐ Certified copies of the priority documents have been received.

　　　2.☐ Certified copies of the priority documents have been received in Application No. _____.

　　　3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

　　* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

1.   This Office Action is in regard to the Preliminary Amendment filed on 11/20/2006.

Claims 1-53 have been presented for examination.

Election/Restrictions

2.   Restriction to one of the following inventions is required under 35 U.S.C. 121:

I.   **Claims 1-11, 33-42**, drawn to "1. (Original) A parity check matrix generation method for

generating parity check matrix H of m rows and n columns in low-density parity-check code;

wherein: said parity check matrix H is made up from partial matrix H1 of m rows and k columns

(where k = n-m) and partial matrix H2 of m rows and m columns; and positions of matrix

elements "1" of each row of said partial matrix H 1 are determined to satisfy conditions that,

when any two rows contained in said partial matrix H1 are selected, periods of the two rows are

relatively prime, or when the periods of the two rows are identical, phases are different. ":

Claims 1-11, 33-42 are classified in class 714, subclass 752.

II.   **Claims 12-21, 43-53**, drawn to "15. (Original) A parity check matrix generation method

for generating a parity check matrix of m rows and n columns in low-density parity-check codes;

wherein: row r of a parity check matrix is generated by using period list $P=\{p(1), p(2), ..., p(PL)\}$

(where $p(1)-p(PL)$ are relatively prime) to: set as "1" matrix elements that correspond to columns

c that satisfy conditions, using integer i, $1 <= c <= n-m+r$ and $c=p(j)-i+n-m+r$ if $N(j-1)+1 <= r N(j)$,

where $N(j)$ is defined as a sum of values from element $p(1)$ to element $p(j)$ of said period list P,

and moreover, $N(0)$ is defined as 0 , and to set as matrix elements that do not satisfy any of

said conditions.": **Claims 12-21, 43-53** are classified in class 714, subclass 758.

III.   **Claims 22-32**, drawn to "22. (Currently Amended) A data transmission system that includes: an encoding device for encoding data and a decoding device for decoding data that have been encoded; wherein: said encoding device, based on prescribed parameters, uses the parity check matrix generation method described in any-one of claim 1 to generate a parity check matrix, uses the generated parity check matrix to perform low-density parity encoding to convert data to codewords, and transmits the converted codewords to said decoding device by way of a transmission line; and said decoding device, based on parameters identical to the parameters used by said encoding device, uses said parity check matrix generation method to generate a parity check matrix, and uses the generated parity check matrix to decode codewords that have been received from said encoding device to convert to the data that preceded encoding.": **Claims 22-32** are classified in class 714, subclass 804.

The **inventions** are distinct, each from the other because of the following reasons:

Inventions Group I, Group II and Group III are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the instant case, subcombination Group I has separate utility such as "positions of matrix elements "1" of each row of said partial matrix H 1 are determined to satisfy conditions that, when any two rows contained in said partial matrix H1 are selected, periods of the two rows are relatively prime, or when the periods of the two rows are identical, phases are different.". Subcombination Group II has separate utility such as "row r of a parity check matrix is generated by using period list P={p(1), p(2), ..., p(PL)} (where p(1)-p(PL) are relatively prime) to: set as "1" matrix elements that correspond to columns c that satisfy conditions, using

integer i, $1<=c<=n-m+r$ and $c=p(j)-i+n-m+r$ if $N(j-1)+1 <= r$ $N(j)$, where $N(j)$ is defined as a sum of values from element $p(1)$ to element $p(j)$ of said period list P, and moreover, $N(0)$ is defined as 0 , and to set as matrix elements that do not satisfy any of said conditions" . Finally, subcombination Group III has separate utility such as "said encoding device, based on prescribed parameters, uses the parity check matrix generation method described in any-one of claim 1, to generate a parity check matrix, uses the generated parity check matrix to perform low-density parity encoding to convert data to codewords, and transmits the converted codewords to said decoding device by way of a transmission line; and said decoding device, based on parameters identical to the parameters used by said encoding device, uses said parity check matrix generation method to generate a parity check matrix, and uses the generated parity check matrix to decode codewords that have been received from said encoding device to convert to the data that preceded encoding. " See MPEP § 806.05(d).

The examiner has required restriction between subcombinations usable together. Where applicant elects a subcombination and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

Because these inventions are independent or distinct for the reasons given above and have acquired a separate status in the art in view of their different classification, restriction for

examination purposes as indicated is proper.

Because these inventions are independent or distinct for the reasons given above and the inventions require a different field of search (see MPEP § 808.02), restriction for examination purposes as indicated is proper.

Because these inventions are independent or distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

Since the restriction is complex and the examiner knows from past experience an election will not be made by telephone. This restriction is proper under MPEP 812.01.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or invention to be examined even though the requirement be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

The election of an invention or species may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse.

Should applicant traverse on the ground that the inventions or species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions or species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C.103(a) of the other invention.

3.   Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Conclusion

4.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fritz Alphonse, whose telephone number is (571) 272-3813. The examiner can normally be reached on M-F, 8:30-6:00, Alt. Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Scott Baderman, can be reached at (571) 272-3644.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-3824

Information regarding the status of an application may also be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Fritz Alphonse/

Examiner, Art Unit 2112

March 28, 2009